For the heating engineer

# Installation instructions

## VRC 470

**GB, IE**

Vaillant

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# 1 Notes on the installation instructions

The following instructions are intended to guide you throughout the entire documentation. Further documents apply in combination with these installation instructions.
We accept no liability for damage caused by failure to observe these instructions.

## 1.1 Observing other applicable documents

➤ Always observe all installation instructions for structural parts and components of the system when installing the VRC 470 controller.

These installation instructions are enclosed with the various system components as well as additional components.

➤ Also observe all the operating instructions included with the system components.

## 1.2 Document storage

➤ Pass these installation instructions and all other applicable documents and, if necessary, any required tools to the system operator.

The system operator will store these so that they are available when required.

## 1.3 Symbols used

The symbols used in the text are explained below: Symbols for identifying dangers are also used in these operating instructions **(→ Section 2.1.1)**.

Symbol that denotes useful tips and information

➤ Symbol for a required action

## 1.4 Applicability of the instructions

These installation instructions are valid for units with the following article numbers only:

| Type designation | Article number | Countries |
|---|---|---|
| VRC 470 | 0020108130 | GB |

**Tab. 1.1 Type designations and article numbers**

The 10-digit article number can be found in the serial number of your unit.
The serial number is displayed when you press the left function key under "Information/Serial number". It is in the second line of the display **(→ Operating instructions)**.

**CE label**
The CE label documents that, based on the type overview, the units comply with the basic requirements of the following directives:
- Electromagnetic compatibility directive (Council Directive 2004/108/EC)
- Low voltage directive (Council Directive 2006/95/EC).

## 1.5 Glossary

Technical terms are explained in the Glossary at the end of these operating instructions.

# 2 Safety

## 2.1 Safety and warning information

➤ When installing the VRC 470, take account of the basic safety instructions and the warning notes that may appear before an action.

### 2.1.1 Classification of warnings

The warning notes are classified in accordance with the severity of the possible danger using the following danger signs and signal words:

| Danger sign | Signal word | Explanation |
|---|---|---|
| | **Danger!** | Immediate risk of death or risk of severe personal injury |
| | **Danger!** | Risk of death from electric shock |
| | **Warning!** | Risk of minor personal injury |
| | **Caution!** | Risk of material or environmental damage |

**Tab. 2.1 Meaning of danger signs and signal words**

### 2.1.2 Structure of warnings

Warning signs are identified by an upper and lower separating line and are laid out according to the following basic principle:

**Signal word!**
**Type and source of danger!**
Explanation of the type and source of danger.
➤ Measures for averting the danger.

## 2.2 Intended use

The Vaillant VRC 470 controller is a state-of-the-art appliance constructed in accordance with recognised safety regulations. Nevertheless, there is a risk of death or serious injury to the operator or others or of damage to the units and other property in the event of improper use or use for which they are not intended.

The Vaillant VRC 470 controller controls a heating system in a weather-compensated and time-dependent manner. The controller is connected to a Vaillant boiler with an eBUS interface.

Operation is permissible with the following components and accessories:
- Domestic hot water cylinder (conventional)
- Vaillant stratified charge cylinder actoSTOR VIH RL
- Circulation pump for the hot water supply
- Second heating circuit
- Solar system
- Remote control unit

Any other use, or use beyond that specified, shall be considered as improper use. Any direct commercial or industrial use is also deemed to be improper. The manufacturer/supplier is not liable for any damage resulting from improper use. In this case, the user alone bears the liability.
It is also considered as intended use to observe:
- the operating and installation instructions
- all other applicable documents
- compliance with the care and maintenance conditions.

Improper use of any kind is prohibited!

## 2.3 Basic safety instructions

The controller may only be installed by a competent person approved at the time by the Health and Safety Executive.
➤ Read through these installation instructions carefully
➤ Carry out the activities that are described in these installation instructions.
➤ During the installation, observe the following safety instructions and regulations.

**Protecting against Legionella**
The controller is furnished with an anti-Legionella function to protect against infection by germs (Legionella). When the function is activated, the water in the domestic hot water cylinder is heated to over 60 °C for at least one hour.
- ➤ Set the anti-Legionella function when installing the controller.
- ➤ Explain to the operator how the anti-Legionella function works.

**Preventing the risk of scalding**
There is a danger of scalding at the hot water draw-off points if the temperatures are greater than 60 °C. Young children and elderly persons are particularly at risk, even at lower temperatures.
- ➤ Select a moderate target temperature.
- ➤ Inform the owner about the risk of scalding when the anti-Legionella function is switched on.

**Protecting the controller from damage**
- ➤ The controller should only be installed in dry rooms.

**Preventing malfunction**
- ➤ Ensure that the heating system is in a technically perfect condition.
- ➤ Ensure that no safety or monitoring devices have been removed, bridged or disabled.
- ➤ Immediately rectify any faults and damage that may negatively affect safety.
- ➤ Inform the operator that he must not cover the controller with furniture, curtains or other objects.
- ➤ Inform the operator that the radiator valves in the room where the controller is installed must be turned fully open.
- ➤ If thermostatic control is activated, advise the operator that, in the room where the controller is mounted, all the radiator valves must be fully open.

## 2.4 Requirements for cables

- ➤ Use standard commercial cables for wiring.

**Minimum cross-section of the cable:**
- Supply cable 230 V (pumps or mixer supply cable): 1.5 $mm^2$
- Low-voltage conductors(sensor or bus lines): 0.75 $mm^2$

**Maximum cable length:**
- Sensor lines: 50 m
- Bus lines: 300 m
- ➤ At lengths of over 10 m, 230V supply cables must be laid separately from sensor or bus lines.
- ➤ Fasten the supply cables using the strain relief device in the wall mount.
- ➤ Do not use the free terminals in the unit as supports for other wiring.
- ➤ The controller should only be installed in dry rooms.

## 2.5 Directives, laws and standards

All wiring must be in accordance with Building Regulations Part P and BS 7671 (IEE Wiring Regulations), and must be carried out by a suitably qualified person.

# 3 System description

## 3.1 System design

The VRC 470 controller controls the Vaillant heating system and hot water production.
You can mount the controller on a wall using the wall mounting base or in the controller slot of a Vaillant boiler, without the wall mounting base.

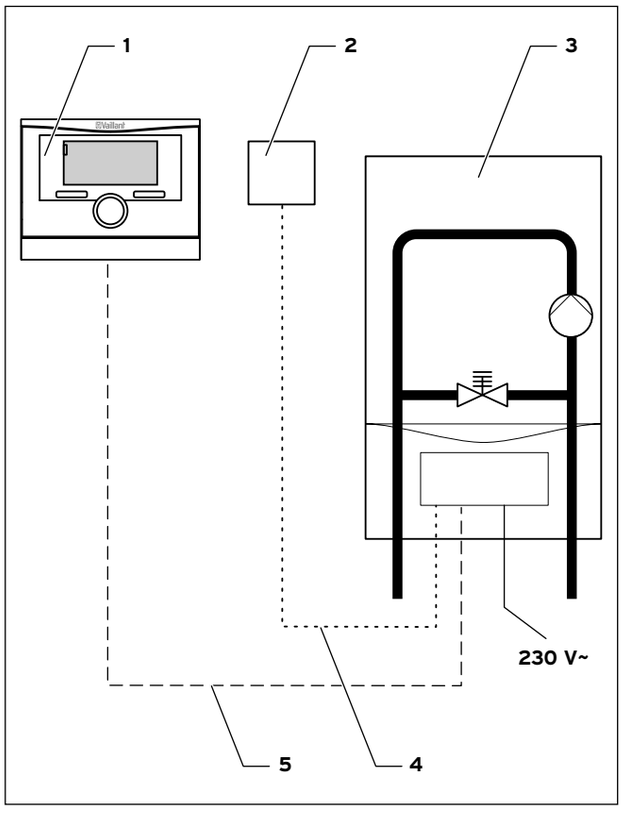


**Fig. 3.1 System drawing**

**Key**
1 Controller VRC 470
2 External sensor VRC 693 or VRC 9535 (DCF77)
3 Boiler
4 Cable connection (VRC 693: 2-core; VRC 9535: 3-core)
5 eBUS connection (2-core)

## 3.2 Operation

**Heating installation**
The VRC 470 is a weather-compensated controller with a separate sensor. The sensor mounted in the open air measures the outside temperature and sends it to the controller. The controller controls the flow temperature of the heating as a function of the outside temperature. If the outside temperature is low, the controller increases the flow temperature, and if the outside temperature is high, it reduces the flow temperature again. Thus, the controller absorbs fluctuations in the outside temperature and the room temperature remains at the constant, preset temperature value.
Hot water production is not affected by the weather compensation.
Data exchange and the power supply to the controller are provided via an eBUS interface.
For remote diagnosis and remote settings, you can equip the controller with the Vaillant diagnostic software vrDIALOG 810/2 and with the Vaillant Internet communication system vrnetDIALOG.

**Hot water production**
With the VRT 470 you can also define the temperature and time for hot water production. The boiler heats the water in the domestic hot water cylinder to the preset temperature. The times at which hot water should be available in the cylinder, can be defined with the help of time periods.
If a circulation pump is installed in the heating system, time periods can also be set for circulation of the hot water.

### 3.3 Unit design

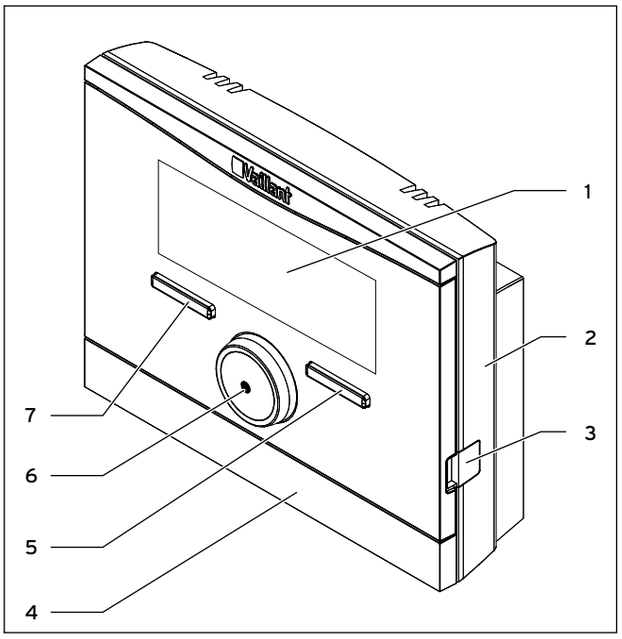


**Fig. 3.2 Front view of VRC 470**

1 Display
2 Wall mounting base
3 Diagnosis socket for the heating engineer
4 Wall mounting base cover
5 Right function key "Mode" (soft key function)
6 Control knob (no key function)
7 Left function key "Menu" (soft key function)

### 3.4 Identification plate

The identification plate is located on the rear side of the controller electronics (PCB) and is no longer accessible from the outside after the controller has been installed in the boiler or after it has been wall-mounted in the living area.

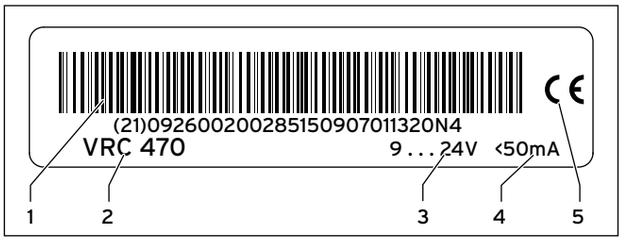


**Fig. 3.3 Identification plate (example)**

**Key**
1 EAN code
2 Unit designation
3 Operating voltage
4 Current consumption
5 CE label

### 3.5 Accessories

If the controller is supplemented with accessories, please note all relevant installation instructions.

The following accessories can be used to expand controller functionalities:

**Multi-function module VR 40**
The multi-function model VR 40 can be used by the controller to control a circulation pump.

**Mixer module VR 61/2**
The mixer module VR 61/2 expands the controller to a 2-circuit controller.

**Solar module VR 68/2**
The solar module VR 68/2 can be used by the controller to control a solar system.

**Control Center VR 65**
The Control Center VR 65 allows for the use of Vaillant low voltage "eBUS" controllers with valves and domestic hot water cylinders from the traditional 230 V range in the English market.

**Remote control unit VR 81/2**
If the controller is installed in the boiler or if the second heating circuit is to be influenced decentrally, you can use the remote control unit VR 81/2. You can use the remote control unit VR 81/2 to set the parameter "Room temp. target".
In addition, the controller displays service and fault messages by means of symbols.
Data interchange is via eBus line.

# 4 Installation

You can either integrate the controller within the boiler or install it separately on a wall in the living area. In the case of wall mounting, you connect the controller to the boiler via a 2-core eBUS line.

## 4.1 Check the scope of delivery

| Quantity | Component |
|---|---|
| 1 | Controller VRC 470 |
| 1 | VRC 9535 external sensor |
| 1 | VRC 693 external sensor |
| 1 | Fastening material (2 screws and 2 wall plugs) |
| 1 | 6-way edge connector |
| 1 | Operating instructions |
| 1 | Installation instructions |

**Tab. 4.1 Scope of delivery**

The controller is supplied with one of the following external sensors:
- VRC 693
  connection to the boiler is via a 2-core cable,
- VRC 9535 (DCF77)
  connection to the boiler is via a 3-core cable.

## 4.2 Requirements for the installation site of the unit

### 4.2.1 Controller

- ➤ If you mount the controller on a wall, position it so that correct measurement of the room temperature is assured; e.g. on an internal wall of the main living room, at a height of approx. 1.5 m
- ➤ If room temperature control is activated, advise the operator that, in the room where the controller is mounted, all the radiator valves must be fully open.

### 4.2.2 External sensor

The installation location of the external sensor should be:
- not fully protected from wind
- not particularly draughty
- not in direct sunlight
- not affected by heat sources
- on a north or north-west facing wall

- ➤ On building with up to three floors, install the external sensor **(→ Section 4.5)** at 2/3 of the total wall height, and on buildings with more than three floors, install it between the 2nd and 3rd floors.

## 4.3 Installing the controller in the boiler

**Danger!**
**Risk of death from live connections!**
When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!
- ➤ Switch the main switch off before working on the control cabinet of the boiler.
- ➤ Disconnect the boiler from the power mains by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- ➤ Secure the power supply against being switched on again.
- ➤ Open the control cabinet only when the appliance is disconnected from the power source.

When fitting the controller in the control cabinet of the boiler, follow the controller installation instructions in the installation instructions for the boiler.

Install the controller in the boiler as follows:
- ➤ Switch off the boiler.
- ➤ Ensure that the boiler is disconnected from the power source.
- ➤ If necessary, open the front cover on the boiler.
- ➤ Carefully lever the blind cover off the control cabinet.
- ➤ Carefully lever the controller off the wall mounting base **(→ Section 4.4.1)**.
- ➤ Check the control cabinet type:

If there are **vertical** plug connections with pins:
- ➤ Carefully push the controller into the plug connection of the control cabinet.

If there are **horizontal** plug connections without pins on the control cabinet:

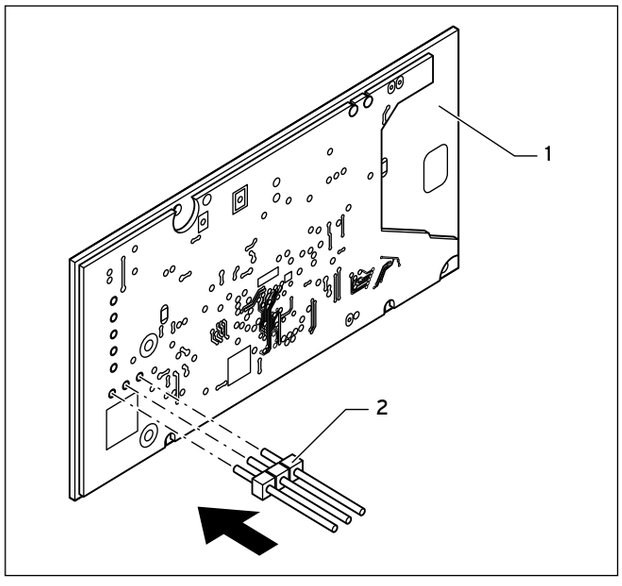


**Fig. 4.1 Connecting the pin header**

- ➤ Connect the 3-way pin header supplied with the controller with the short ends in the 3 horizontal openings on the controller PCB.
- ➤ Carefully push the controller with the pin header into the plug connection of the control cabinet.

- ➤ If not already done, mount the external sensor **(→ Section 4.5)**.
- ➤ Perform electrical installation of the external sensor **(→ Section 5)**.
- ➤ Switch on the power supply to the boiler.
- ➤ Bring the boiler into operation.
- ➤ If necessary, close the front cover of the boiler again.

## 4.4 Mounting the controller in the living room

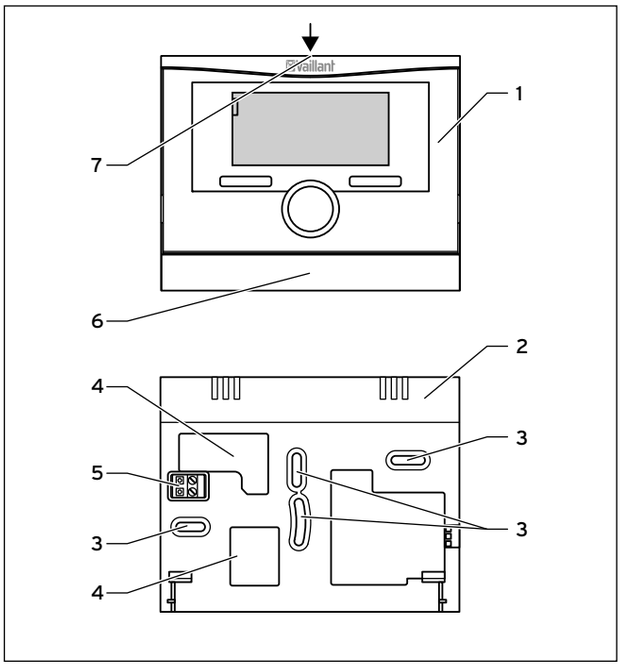


**Fig. 4.2 Mounting the controller**

1 Controller VRC 470
2 Wall mounting base
3 Mounting holes
4 Openings for cable entry
5 Pin header with terminals for the eBUS cable
6 Wall mounting base cover
7 Slot for screwdriver

Before mounting the controller in the living room, you must disconnect the controller from the wall mounting base. You can then secure the wall mounting base to the wall.

### 4.4.1 Removing the controller from the wall mounting base

- ➤ Insert a screwdriver into the slot (**7**) on the wall mounting base (**2**).
- ➤ Carefully lever the controller (**1**) out of the wall mounting base (**2**).

### 4.4.2 Secure the wall mounting base to the wall

- ➤ Mark the position on the wall. Take the eBUS line route into account when doing so.
- ➤ Drill two holes with 6 mm diameter in accordance with the mounting holes (**3**).
- ➤ Insert the wall plugs supplied.
- ➤ Insert the eBUS cable through one of the cable opening (**4**).

- ➤ Use the screws supplied to secure the wall mounting base.
- ➤ Connect the eBUS cable to the terminals of the pin header **(→ Section 5.3)**.

**Installing the controller**

- ➤ Carefully insert the controller in the wall mounting base. Take care to ensure that the pin header (**5**) on the wall mounting base fits in the controller connector provided.
- ➤ Carefully press the controller into the wall mounting base until the locking tabs on the controller are heard to latch into the sides of the wall mounting base.

## 4.5 Installing the external sensor

**Caution!**
**Risk of material damage if fitted incorrectly!**
Incorrect fitting can cause damage to the unit and the wall of the building, e.g. from dampness.

- ➤ Observe the cable routing described and the correct installation position of the external sensor.

Installation is the same for both external sensors, with the following exceptions:
- the VRC 693 requires a 2-core connection cable
- the VRC 9535 requires a 3-core connection cable

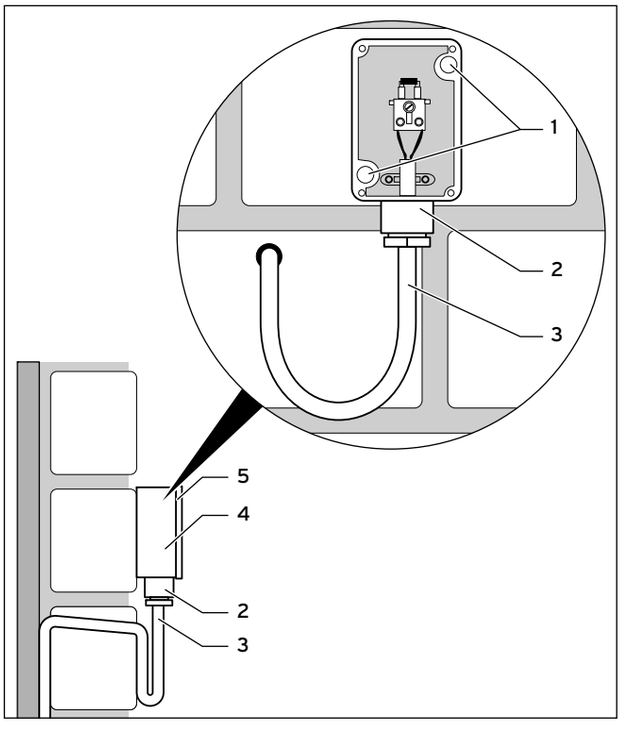


**Fig. 4.3 Fitting the external sensor VRC 693**

1 Mounting holes
2 Cap nut for cable entry point
3 Connection cable with drip loop
4 Wall mounting base
5 Housing cover

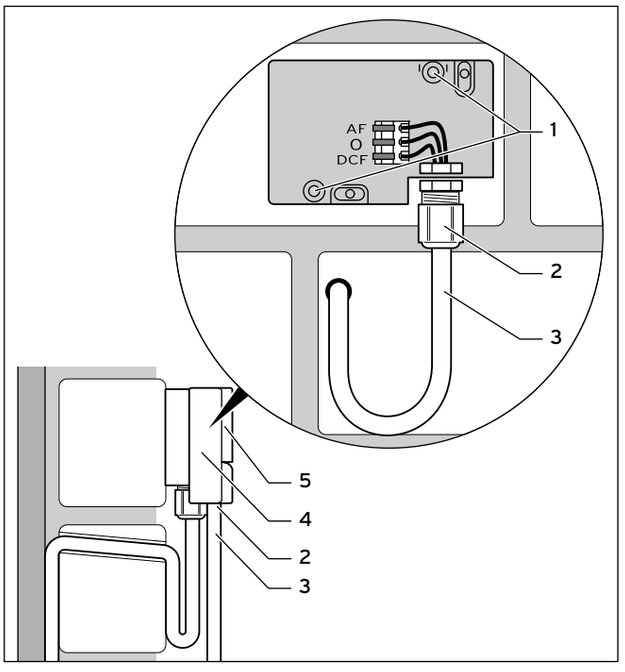


**Fig. 4.4 Fitting the external sensor VRC 9535**

1 Mounting holes
2 Cap nut for cable entry point
3 Connection cable with drip loop
4 Wall mounting base
5 Housing cover

Install the external sensor as follows:

- ➤ Mark the position on the wall. Observe the cable routing for the external sensor.
- ➤ Route the connection cable (**3**) on-site with a slight incline to the outside and with a loop to catch drips.
- ➤ Remove the casing cover (**5**) from the external sensor.
- ➤ Drill two holes with 6 mm diameter in accordance with the mounting holes (**1**).
- ➤ Insert the wall plugs supplied.
- ➤ Fix the wall mounting base (**4**) to the wall with two screws. The cable entry must point downwards.
- ➤ Unfasten the cap nut (**2**) slightly and push the connecting cable through the cable entry from below.
- ➤ Connect the external sensor as described in **Section 5.1** for the VRC 693, or as described in **Section 5.2** for the VRC 9535.
- ➤ Retighten the cap nut (**2**). The packing in the cable entry adapts to the diameter of the cable used (Cable diameter: 4.5 mm to 10 mm).
- ➤ Place the gasket between the wall mounting base and the housing cover.
- ➤ Push the housing cover onto the wall mounting base until it clicks in position.

# 5 Electrical installation

**Danger!**
**Risk of death from live connections!**
When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- ➤ Switch the main switch off before working on the control cabinet of the boiler.
- ➤ Disconnect the boiler from the power mains by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- ➤ Secure the power supply against being switched on again.
- ➤ Open the control cabinet only when the appliance is disconnected from the power source.

## 5.1 Connecting external sensor VRC 693

- ➤ Disconnect the power supply to the boiler.
- ➤ Secure the power supply to the boiler against being switched on again.

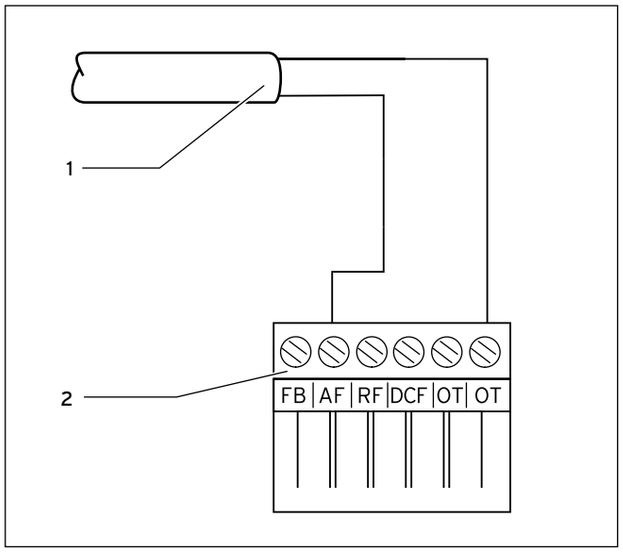


**Fig. 5.1 Connecting external sensor VRC 693**

1 Connection cable to the external sensor VRC 693
2 6-way edge connector for plug location X41 (boiler)

Connect external sensor VRC 693 to the boiler as follows:

- ➤ Connect the connection cable to the terminals of the external sensor (**1**).
- ➤ Connect the connection cable to the 6-way edge connector (**2**).
- ➤ Guide the connection cable with the edge connector into the control cabinet of the boiler.
- ➤ Connect the 6-way edge connector (**2**) to slot X41 of the PCB of the control cabinet.

## 5.2 Connecting external sensor VRC 9535

- ➤ Disconnect the power supply to the boiler.
- ➤ Secure the power supply to the boiler against being switched on again.

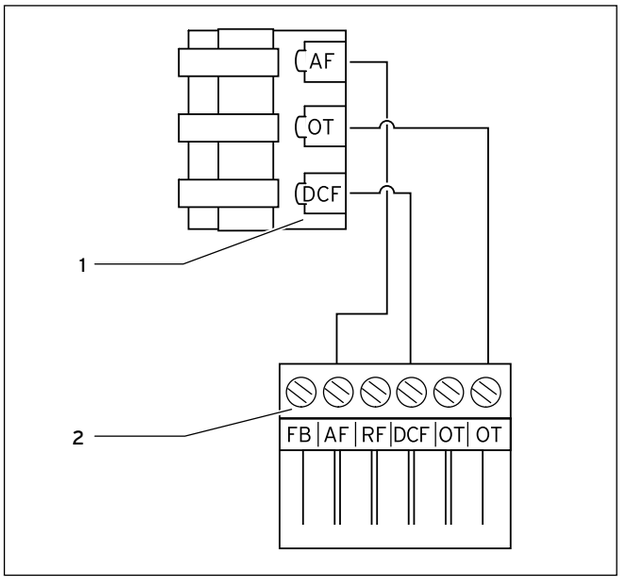


**Fig. 5.2 Connecting external sensor VRC 9535**

1 Terminal rail VRC 9535 external connector
2 6-way edge connector for plug location X41 (boiler)

Connect external sensor VRC 9535 to the boiler as follows:

- ➤ Connect the connection cable to the terminal strip of the external sensor (**1**).
- ➤ Connect the connection cable to the 6-way edge connector (**2**).
- ➤ Guide the connection cable with the edge connector into the control cabinet of the boiler.
- ➤ Connect the 6-way edge connector (**2**) to slot X41 of the PCB of the control cabinet.

## 5.3 Connecting the controller installed in the living room

**Caution!**
**Malfunctions caused by incorrect installation!**
Without a bridge between terminals 3 and 4 on the PCB in the control cabinet, the boiler cannot work.
- ➤ When connecting the controller, ensure that the bridge between terminals 3 and 4 is installed.

- ➤ Disconnect the power supply to the boiler.
- ➤ Secure the power supply to the boiler against being switched on again.

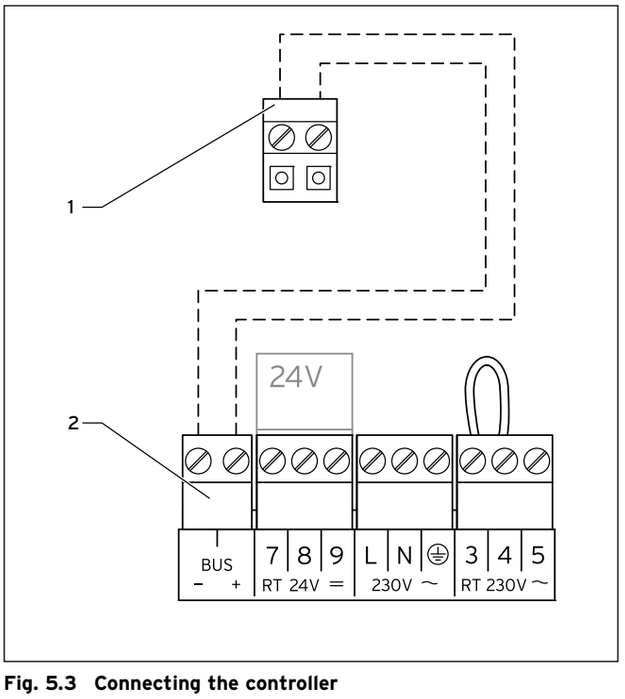


**Fig. 5.3 Connecting the controller**

**Key**
1 VRC 470
2 Boiler terminal strip

When connecting the eBUS line, there is no need pay attention to the polarity. If the two connections are switched over, communication is not affected.

Connect the controller to the boiler as follows:
- ➤ Connect the eBUS line to the terminals (**1**) of the pin header in the wall mounting base of the controller.
- ➤ Connect the eBUS line to the terminal strip of the boiler (**2**).

# 6 Start-up

When you start the controller for the first time after electrical installation or after replacement, the Installation assistant starts automatically. Using this Installation assistant, you can create the main settings for the heating system.
The operating concept, operating example and menu structure are described in the operating instructions of the controller (**→ Operating instructions**).

All settings that you have made via the Installation assistant, can be changed again at a later time via the "Installer level" operating level.
The reading and setting options of the Installer level are described in **(→ Section 7)** and **(→ Section 8)**.

## 6.1 Overview of Installation assistant set-up options

| Setting | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|
| | min. | max. | | | | |
| Language | – | – | – | Languages available for selection | German | |
| Heating circuit 1 | | | | Generator circuit, inactive | Generator circuit | |
| Heating circuit 2 [2)] | | | | Zone, mixing circuit, inactive | Mixing circuit | |
| LP/ZP relay connection [2)] | | | | Cylinder charge pump, circulation pump, not connected | Not connected | |
| Solar flow volume [1)] | 0.0 | 99.5 | l/min | 0.5 | 17.5 | |
| Multi relay [1)] | | | | Difference control, 2nd cylinder | Difference control | |
| Solar pump kick [1)] | | | | OFF, ON | Off | |
| Solar circuit prot. [1)] | Off, 110 | 150 | °C | 1 | 150 | |
| Installation country [2)] | | | | Country available for selection | Germany | |
| Heating circuit conf. [3)] | | | | HEATING 1, HEATING 2, HEATING 1 & HEATING 2 | HEATING 1 | |
| Low loss header [4)] | | | | On, Off | Off | |
| Cylinder | | | | active, inactive | active | |

**Tab. 6.1 Overview of Installation assistant set-up options**

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if solar station VMS is connected.
3) Appears only if mixing module VR 61/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.

### 6.2 Making settings for the operator

Make the following settings for the operator via the Operating level:
- ➤ If no DCF77 receiver is installed, set the date and time.
- ➤ If necessary, change the factory-set designations of the components in the heating system.
- ➤ Set the mode for the heating function. The mode for hot water production is dependent on this and cannot be set separately.
- ➤ Set the target room temperature ("Desired day temperature").
- ➤ Set the set-back temperature ("Desired night temperature").
- ➤ Set the hot water temperature ("Desired hot water temperature").
- ➤ Set the period for automatic mode of the heating function.
- ➤ Set the period for hot water production.
- ➤ If relevant, set the period for circulation.

### 6.3 Setting other parameters of the heating system

You can set other parameters via the "Installer" operating level, **(→ Section 7)** and **(→ Section 8)**.

# 7 Operation

The menu structure, operating concept and operating example are described in the operating instructions for the controller (→ **Operating instructions**).

The controller has two operating levels, the Operator level and the Installer level.

The reading and set-up options in Operator level are also described in the operating instructions.

Below, you can find the reading and set-up options which can be accessed via the left function key "Menu" and list entry "Installer level".

Several consecutive displays indicate possible additional heating circuits. Menu entries shown in grey are only available if a corresponding expansion module is connected.

## 7.1 Menu structure overview

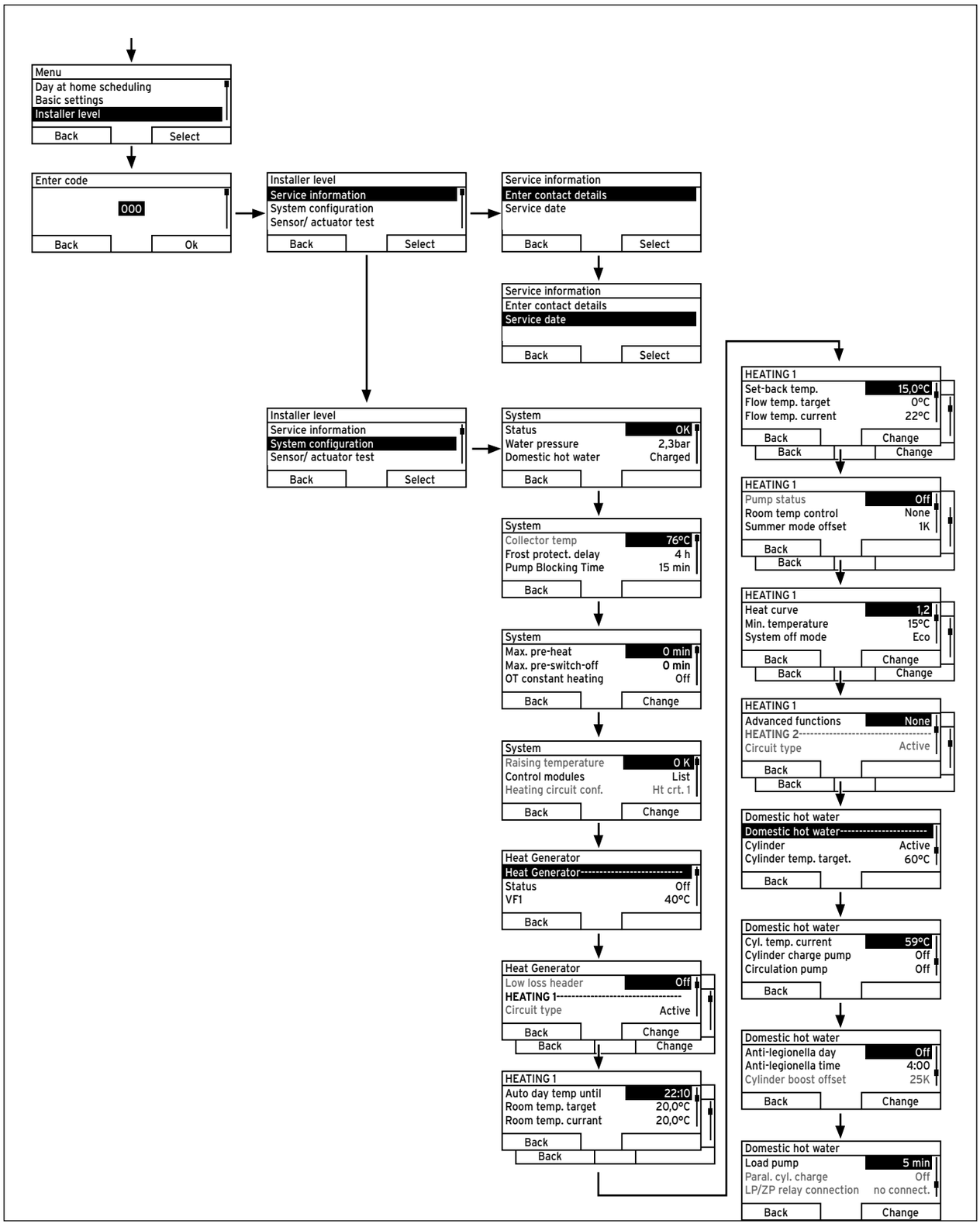


**Fig. 7.1 Installer level menu structure Part 1**

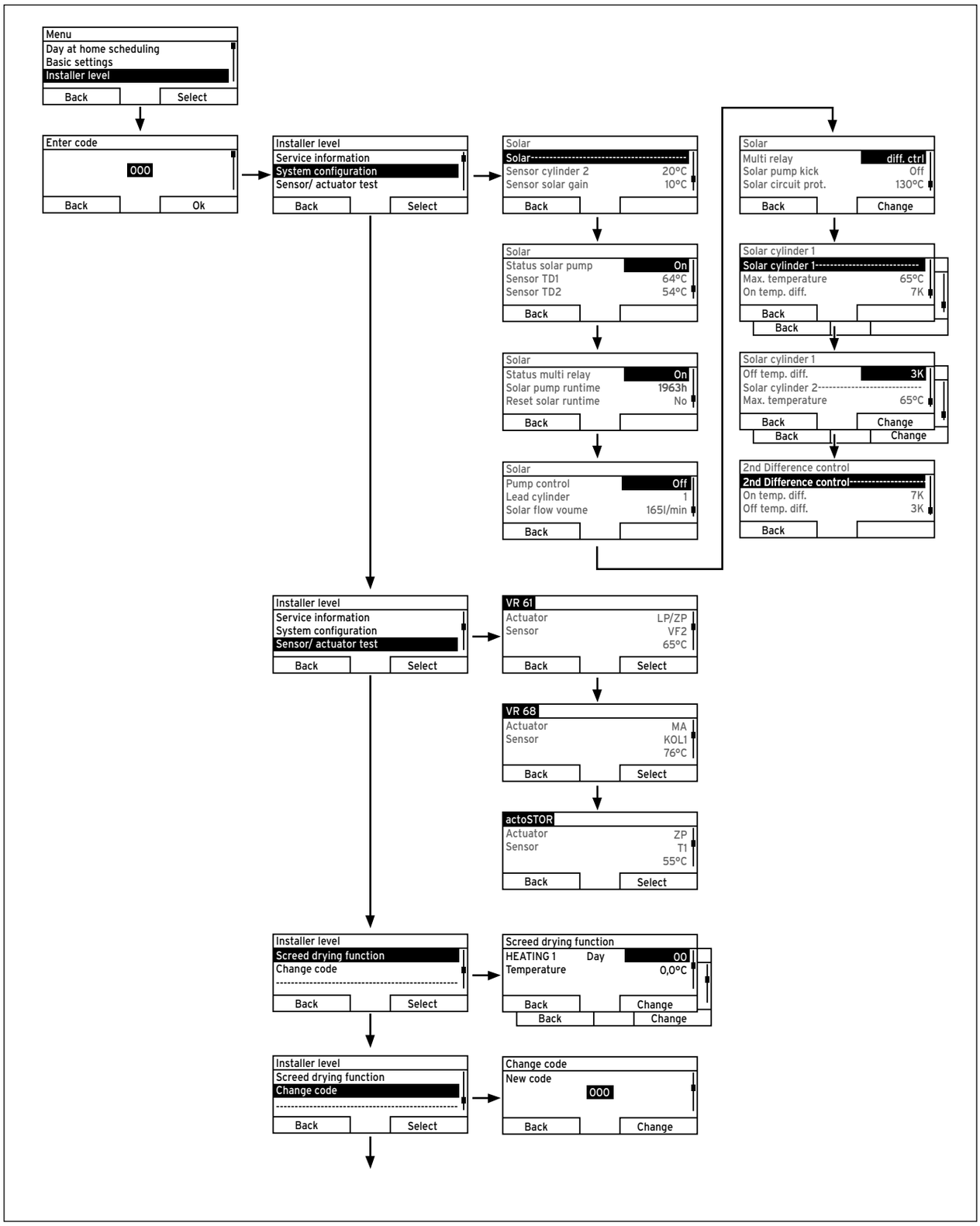


**Fig. 7.2 Installer level menu structure Part 2**

## 7.2 Installer level overview

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | | | Enter code | 000 | 999 | – | 1 | 000 | |
| | Service information | Enter contact details | Installer | 1 | 11 | Figures | A to Z, 0 to 9, blank spaces | | |
| | | | Phone | 1 | 12 | Numbers | 0 to 9, blank spaces, hyphen | | |
| | | Service date | Next service on | | | Date | | | |
| | System configuration | | System | | | | | | |
| | | | Status | Current value* | | – | | | |
| | | | Water pressure | Current value | | bar | | | |
| | | | Domestic hot water | Current value | | °C | | | |
| | | | Collector temp. [1] | Current value | | °C | | | |
| | | | Frost protect. delay | 0 | 12 | h | 1 | 4 | |
| | | | Pump Blocking Time | Off, 5 | 60 | min | 1 | 15 | |
| | | | Max. pre-heat | 0 | 300 | min | 10 | 0 | |
| | | | Max. pre-switch-off | 0 | 120 | min | 10 | 0 | |
| | | | OT constant heating | Off, -25 | 10 | °C | 1 | Off | |
| | | | Raising temperature [2] | 0 | 15 | K | | 0 | |
| | | | Control modules | List | | | Software version | | |
| | | | Heating circuit conf. [2] | | | | Ht crt. 1, Ht crt. 2, Ht crt. 1 & Ht crt. 2 | Ht crt. 1 | |

**Tab. 7.1 Installer level overview**

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | System configuration | | Heat generator | | | | | | |
| | | | Status | Current value | | | Off, Heating, DHW | | |
| | | | VF1 | Current value | | | | | |
| | | | Low loss header [4] | Current value | | | On, Off | Off | |
| | | | HEATING 1 | | | | | | |
| | | | Circuit type [2] | Inactive | Active | | Inactive, Active | Active | |
| | | | Auto day temp until | Current value | | h:min | | | |
| | | | Room temp. target (Day temperature) | 5 | 30 | °C | 0.5 | 20 | |
| | | | Room temp. currant [5] (Room temperature) | Current value | | °C | | | |
| | | | Set-back temp. (Night temperature) | 5 | 30 | °C | 0.5 | 15 | |
| | | | Flow temp. target | Current value | | °C | | | |
| | | | Flow temp. current | Current value | | °C | | | |
| | | | Pump status [2] | Current value | | | On, Off | | |
| | | | Room temp control | | | | None, Modulation, Thermost. | None | |
| | | | Summer mode offset | -3 | 30 | K | 1 | 1 | |
| | | | Heat curve | 0.20 | 4.0 | | 0.05 | 1.2 | |
| | | | Min. temperature | 15 | 90 | °C | 1 | 15 | |
| | | | System off mode | | | | Eco, Set-back, Frost prot. | Eco | |
| | | | Advanced functions | Current value | | | | None | |

**Tab. 7.1 Installer level overview**

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | System configura-tion | | HEATING 2 [2] | | | | | | |
| | | | Circuit type | Inactive | Active | | Inactive, active, zone | Active | |
| | | | Auto day temp until | Current value | | hr:min | | | |
| | | | Room temp. target (Day temperature) | 5 | 30 | °C | 0.5 | 20 | |
| | | | Room temp. currant (Room temperature) | Current value | | °C | | | |
| | | | Set-back temp. (Night temperature) | 5 | 30 | °C | 0.5 | 15 | |
| | | | Flow temp. target | Current value | | °C | | | |
| | | | Flow temp. current | Current value | | °C | | | |
| | | | Pump status | Current value | | | On, Off | | |
| | | | Mixer status | Current value | | | Opening, Stationary, Closing | | |
| | | | Room temp control | | | | None, Modulation, Thermost. | None | |
| | | | Summer mode offset | 0 | 30 | K | 1 | 1 | |
| | | | Heat curve | 0.20 | 4.0 | | 0.05 | 1.2 | |
| | | | Min. temperature | 15 | 90 | °C | 1 | 15 | |
| | | | Max. temperature | 15 | 90 | °C | 1 | 75 | |
| | | | System off mode | | | | Eco, Set-back, Frost prot. | Frost prot. | |
| | | | Advanced functions | Current value | | | None, Away from home, At home, Party function, Cyl. boost | None | |

**Tab. 7.1 Installer level overview**

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | System configura-tion | | Domestic hot water | | | | | | |
| | | | Cylinder | Inactive | Active | | Active, inactive | Active | |
| | | | Cylinder temp. target | 35 | 70 | °C | 1 | 60 | |
| | | | Cyl. temp. current | Current value | | °C | | | |
| | | | Cylinder charge pump | Current value | | | On, Off | | |
| | | | Circulation pump | Current value | | | On, Off | | |
| | | | Anti-legionella day | | | | Mon, Tue, Wed, Thu, Fri, Sat, Sun, Off, Mon-Sun | Off | |
| | | | Anti-legionella time | 0:00 | 23:50 | hr:min | 10 min | 4:00 | |
| | | | Cylinder boost offset [3] | 15 | 40 | K | 1 | 25 | |
| | | | Load pump | 0 | 10 | min | 1 | 5 | |
| | | | Paral. cyl. charge [2] | Off | On | | Off, On | Off | |
| | | | LP/ZP relay connection [2] | | | | no connect., Circ. pump, Charg.pump | no con-nect. | |

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | System configuration | | Solar [1] | | | | | | |
| | | | Cylinder sensor 2 | Current value | | °C | | | |
| | | | Sensor solar gain | Current value | | °C | | | |
| | | | Status solar pump | Current value | | | On, Off | | |
| | | | Sensor TD1 | Current value | | °C | | | |
| | | | Sensor TD2 | Current value | | °C | | | |
| | | | Status multi relay | Current value | | | On, Off | | |
| | | | Solar pump runtime | Current value | | h | | | |
| | | | Reset solar runtime | No | Yes | | No, Yes | No | |
| | | | Pump control | Current value | | | Off, On | Off | |
| | | | Lead cylinder | 1 | 2 | | 1, 2 | 1 | |
| | | | Solar flow volume | 0.0 | 99.0 | l/min | 0.5 | 3.5 | |
| | | | Multi relay | | | | diff. ctrl, Cylinder2 | diff. ctrl | |
| | | | Solar pump kick | On | Off | | On, Off | Off | |
| | | | Solar circuit prot. | Off, 110 | 150 | °C | 1 | 130 | |
| | | | Solar cylinder 1 [1] | | | | | | |
| | | | Max. temperature | 20 | 90 | °C | 1 | 65 | |
| | | | On temp. diff. | 2 | 25 | K | 1 | 7 | |
| | | | Off temp. diff. | 1 | 20 | K | 1 | 3 | |

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | System configuration | | Solar cylinder 2 [1] | | | | | | |
| | | | Max. temperature | 20 | 90 | °C | 1 | 65 | |
| | | | On temp. diff. | 2 | 25 | K | 1 | 7 | |
| | | | Off temp. diff. | 1 | 20 | K | 1 | 3 | |
| | | | 2nd Difference control | | | | | | |
| | | | On temp. diff. | 2 | 25 | K | 1 | 7 | |
| | | | Off temp. diff. | 1 | 20 | K | 1 | 3 | |
| | Sensor/ actuator test | | Select module | – | – | – | Connected expansion modules | | |
| | | | VR 61 [2] | | | | | | |
| | | | Actuator | | | – | LP/ZP, HK1-P, HK2 AUF, HK2 ZU, HK2-P | | |
| | | | Sensor | | | | VF2 | VF2 | |
| | | | VR 68 [1] | | | | | | |
| | | | Actuator | – | – | – | MA, KOL1-P, LEG-P | | |
| | | | Sensor | | | | KOL1, SP1, SP2, Yield, TD1, TD2 | | |
| | | | actoSTOR [4] | | | | | | |
| | | | Actuator | – | – | – | ZP, P1, P2, AL | | |
| | | | Sensor | | | | T1, T2, T3, T4, Anode | | |

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.
* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

| Selection level 1 | Selection level 2 | Selection level 3 | Setting level | Values | | Unit | Step size, select | Factory reset | Own setting |
|---|---|---|---|---|---|---|---|---|---|
| | | | | min. | max. | | | | |
| Installer level | Screed drying function | | HEATING 1 Day [6] | 00 | 29 | Day | 1 | 00 | |
| | | | Temperature [6] | Curr. value | 45 | °C | | | |
| | | | HEATING 2 Day [2] | 00 | 29 | Day | 1 | 00 | |
| | | | Temperature | Curr. value | 45 | °C | | | |
| | Change code | | New code | 000 | 999 | | 1 | 000 | |

1) Appears only if solar module VR 68/2 is connected.
2) Appears only if mixing module VR 61/2 is connected.
3) Appears only if mixing module VR 61/2 or solar module VR 68/2 is connected.
4) Appears only if cylinder actoSTOR VIH RL is connected.
5) Appears only if remote control unit VR 81/2 is connected.
6) Appears only if no mixing module VR 61/2 is connected.

* If there is no fault, then the status is "OK". If there is a fault, "Fault" appears here and you can read the error message **(→ Section 10.2)** here.

# 8 Functional description

The list entry "Installer level" in selection level 1 of the menu structure has five sub-entries with further selection levels:
- Service information
- System configuration
- Sensor/ actuator test
- Screed drying function
- Change code

Functions with read options and functions with set-up options are grouped together there.

The list of the second selection level "System configuration" is structured by components of the heating system:
- System
- Heat generator
- HEATING 1
- Domestic hot water

If an expansion module VR 61/2 is connected, also:
- HEATING 2

If an expansion module VR 68/2 is connected, also:
- Solar
- Solar cylinder 1
- Solar cylinder 2
- 2nd Difference control

## 8.1 Service information

### 8.1.1 Entering contact details

**Menu → Installer level → Service information → Enter contact details**
You can enter your contact details (company name and phone number) in the controller. When the date of the next service appointment is reached, the operator can view the data in the display of the controller.
You must run through each digit of the company name and telephone number and set them separately.

### 8.1.2 Entering the service date

**Menu → Installer level → Service information → Service date**
In the controller, you can save a date (day, month, year) for the next regular service.
When the date for the next service appointment is reached, the message "Service" is displayed in the basic display of the controller.
If a service appointment is saved in the boiler, the message "Service heat generator" appears on the boiler when this date is reached.

The message is switched off if:
- the date is in the future.
- the initial date 01.01.2011 is set.

## 8.2 System configuration: System

### 8.2.1 Reading the system status

**Menu → Installer level → System configuration [System ----] → Status**
This function allows you to read the status of the heating system. If there is no fault, the message "OK" appears here. If there is a fault, the status "Fault" is displayed. If you press the right function key, the list of error messages will be displayed.
Error messages are described in **(→ Section 10.2)**.

### 8.2.2 Reading the water pressure of the heating system

**Menu → Installer level → System configuration [System ----] → Water pressure**
With this function, you can read the water pressure of the heating system, if the boiler provides this information.

### 8.2.3 Reading the hot water production status

**Menu → Installer level → System configuration [System ----] → Domestic hot water**
This function allows you to read the hot water production status (Charged, Not charged).

### 8.2.4 Reading the collector temperature

Only with a connected VR 68/2
**Menu → Installer level → System configuration [System ----] → Collector temp**
This function allows you to read the current temperature at the collector sensor.

### 8.2.5 Setting the frost protection delay

**Menu → Installer level → System configuration [System ----] → Frost protect. delay**
This function allows you to delay activation of the frost protection function by setting a delay time.
The frost protection function guarantees frost protection in the heating system for all connected heating circuits in mode "Off" and "Eco" (outside the set period).
If the outside temperature falls below 3 °C, the set-back temperature is applied as the target room temperature.
The heating circuit pump is switched on.
The frost protection function is also activated when the measured room temperature falls below the preset set-back temperature (regardless of the measured outside temperature).
If you set a delay time, the frost protection function is suppressed during this period.
This function is only effective if the "Eco" setting is selected for the "System off mode" function.

### 8.2.6 Setting the pump blocking time

**Menu → Installer level → System configuration [System ----] → Pump Blocking Time**
To save energy, you can set the pump blocking time during which the heating circuit pump remains deactivated.
For each heating circuit, the controller checks if the measured flow temperature is 2 K above the calculated target value. If this is the case for 15 minutes, the pump of the heating circuit in question is deactivated for the set blocking time. The mixer remains in its current position.
The blocking time set is reduced as a function of the outside temperature.
Example:
Blocking time set = 60 minutes
Outside temperature 20 °C = Blocking time 60 min.
Outside temperature 3 °C = Blocking time 5 min.

### 8.2.7 Setting the maximum pre-heating time

**Menu → Installer level → System configuration [System ----] → Max. pre-heat**
This function allows you to start the heating function for the heating circuits a set amount of time before the first period of the day, so that the target room temperature is already reached at the beginning of the first period.
The start of heating is determined as a function of the outside temperature (OT):
OT ≤ –20 °C : preset duration of the pre-heat time
OT ≥ +20 °C : no pre-heat time
The duration of the pre-heat time is interpolated linearly between these two values.

### 8.2.8 Setting the maximum pre-switch-off time

**Menu → Installer level → System configuration [System ----] → Max. pre-switch-off**
You can avoid unnecessary heating in the heating system immediately before a defined switch-off time by setting a pre-switch-off time.
The controller calculates the actual period depending on the outside temperature.
Set the maximum period desired by the owner here.
If the outside temperature is at -20 °C, no pre-switch-off occurs.
If the outside temperature is +20 °C, the set, maximum pre-switch-off time comes into effect.
With outside temperatures in the range of -20 °C to +20 °C the controller calculates a value corresponding to a linear curve between -20 °C and +20 °C.

The calculation is made for the day already started. The earliest start time is 0:00 hours. If a pre-switch-off time of 120 minutes is set and a period of 0:00 to 01:00 hours, the pre-switch-off time does not start at 23:00 hours on the previous day, but at 0:00 hours.

### 8.2.9 Setting the temperature threshold for constant heating

**Menu → Installer level → System configuration [System ----] → OT constant heating**
"Outside temperature constant heating" is a configurable temperature value below which heating using the target room temperature/heating curve assigned to the heating circuit is constant outside the programmed period.
The function allows you to define a value for the outside temperature at which a set-back or total shut-down should no longer occur.

#### 8.2.10 Setting the raising temperature

Only with a connected VR 61/2
**Menu → Installer level → System configuration [System ----] → Raising temperature**
The raising temperature function increases the current heating circuit target value for the mixing circuit by the set value.
This function allows you to heat the mixing circuit to the target temperature during the morning pre-heat mode (also at generator temperature in the target value), although this fixed addition acutely lowers the temperature of the mixing circuit.
The function also allows for an optimal control range for operation of the mixer. Stable operation is only possible if the mixer only rarely has to move to the limit stop. This ensures improved quality of control.

#### 8.2.11 Reading the software version

**Menu → Installer level → System configuration [System ----] → Control modules**
This function allows you to read the software versions of the display, the boiler and all expansion modules connected via eBUS.

#### 8.2.12 Configuring the heating circuit

**Menu → Installer level → System configuration [System ----] → Heating circuit conf.**
This function allows you to define the heating circuit(s) to which the mode setting from Operator level should apply.
Example:
There are two connected heating circuits and you select HEATING 1. For both heating circuits, you activate the "Automatic mode" via the left function key "Menu → Basic settings → Mode". If the operator now changes the mode to "Comfort mode" via the right function key "Mode", then the mode is only changed for HEATING 1. HEATING 2 continues to be operated in "Automatic mode".

### 8.3 System configuration: Heat generator:

#### 8.3.1 Reading the status of the heat generator

**Menu → Installer level → System configuration [Heat Generator ----] → Status**
This function allows you to read the current status of the heat generator (boiler): Off, heating mode, hot water production.

#### 8.3.2 Reading the value of temperature sensor VF1

**Menu → Installer level → System configuration [Heat Generator ----] → VF1**
This function allows you to read the current value of temperature sensor VF1.

#### 8.3.3 Activating the low loss header

**Menu → Installer level → System configuration [Heat Generator ----] → Low loss header**
Only with a connected actoSTOR VIH RL
This function allows you to make a setting in the controller to define whether or not the cylinder is connected to the boiler via a low loss header.

### 8.4 System configuration: HEATING 1 and, if relevant, HEATING 2

#### 8.4.1 Activating heating circuits

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Circuit type**
This function allows you to define whether or not HEATING 1 or, if relevant, HEATING 2 (if expansion module VR 61/2 is connected) or zone (HEATING 2 without mixing valve) are each activated or deactivated.
HEATING 1 is always defined as the Generator circuit, HEATING 2 is always the Mixing circuit.

#### 8.4.2 Reading the end of the current time period

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Auto day temp. until**
With this function, you can stipulate for a heating circuit, whether or not a set period is active for the "Auto" mode and how much of the period is still remaining. To do this, the controller must be in "Automatic mode". The information is specified in hr:min.

### 8.4.3 Setting the room temperature

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Room temp. target**
This function allows you to set the desired target room temperature separately for each heating circuit.

### 8.4.4 Reading the current room temperature

**Menu → Installer level → System configuration [HEATING 1 ----] → Room temp. currant**
This function allows you to read the current value of the room temperature sensor integrated in the controller.

### 8.4.5 Setting the set-back temperature (set-back temp.)

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Set-back temp.**
This function allows you to set the desired set-back temperature separately for each heating circuit. The set-back temperature is the temperature to which the heating is to be reduced at times of low heat demand (e.g. overnight).

### 8.4.6 Reading the target flow temperature

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Flow temp. target**
This function allows you to set the target flow temperature separately for each heating circuit.

### 8.4.7 Reading the current flow temperature

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Flow temp. current**
This function allows you to read the current flow temperature separately for each heating circuit.

### 8.4.8 Reading the status of the heating circuit pump

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Pump status**
Only with a connected VR 61/2
This function allows you to read the current status (On, Off) of the heating circuit pump separately for each heating circuit.

### 8.4.9 Reading the status of the heating circuit mixer

**Menu → Installer level → System configuration [HEATING 2 ----] → Mixer status**
This function allows you to read the current status (opening, closing, stationary) of the heating circuit mixer for HEATING 2.

### 8.4.10 Activating room temperature control

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Room temp control**
This function allows you to define if the temperature sensor integrated in the controller or in the remote control unit should be used.
Requirement: The controller is not installed in the boiler, but is wall-mounted or the VR 81/2 remote control unit is connected.

**None:**
Temperature sensor is not used for control.

**Thermostatic control:**
The built-in temperature sensor measures the current room temperature in the reference room. This value is compared with the target room temperature and, if there is a difference, results in adjustment of the heating flow temperature by means of the so-called "Effective target room temperature".
Effective room set target temp. = set room target temp. + (set room set temp. - measured room set temp.)
The effective target room temperature is then used for controlling instead of the set target room temperature.

**Thermostat:**
Works in the same way as thermostatic control, however the heating circuit is also switched off when the measured target room temperature is +3 °C greater than the set target room temperature.
When the room temperature falls 2 °C below the set target room temperature again, the heating circuit is switched on again.
The use of room thermostat control, in combination with careful selection of the heating curve, leads to optimum control of the heating installation.

### 8.4.11 Activating automatic summer time recognition

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Summer mode offset**
This function allows you to define if the controller should automatically activate "Summer mode" based on a temperature calculation for all heating circuits. The controller remains in automatic mode.

To activate this function, set an offset value (° K). The controller activates summer mode when the outside temperature is greater than or equal to the current target room temperature + the set offset value. The target room temperature at night, for example, is the set-back temperature. The controller deactivates summer mode when the outside temperature is less than the target room temperature + the set offset value - 1 K.

### 8.4.12 Setting the heating curve

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Heat curve**
If the heating curve setting is not sufficient to control the living room climate according to the operator's wishes, you can adapt the heating curve setting made during installation.

### 8.4.13 Setting the minimum flow temperature for heating circuits

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Min. temperature**
You can enter a minimum value for the flow temperature for each heating circuit, which should not be undershot during control. The controller compares the calculated flow temperature with the value set for the minimum temperature and, if there is a difference, adjusts to the higher value.

### 8.4.14 Setting the maximum flow temperature for mixing circuit

**Menu → Installer level → System configuration [HEATING 2 ----] → Max. temperature**
Only with a connected VR 61/2
You can enter a maximum value for the flow temperature of HEATING 2, which should not be undershot during control. The controller compares the calculated flow temperature with the value set for the maximum temperature and, if there is a difference, adjusts to the lower value.

### 8.4.15 Reading the status of special operating modes

**Menu → Installer level → System configuration [HEATING 1/2 ----] → Advanced functions**
With this function, you can define if a special operating mode (advanced function), such as Party function, Intermittent ventilation, etc. should be activated for a heating circuit.

### 8.4.16 Specifying control modes outside time periods

**Menu → Installer level → System configuration [HEATING 1/2 ----] → System off mode**
This function enables you to specify, for each heating circuit separately, the controller functions in Automatic mode outside active time periods.
Factory reset: Frost prot.
There are three control modes for selection, which you can adapt further by using the Room temperature control:

- **Frost protection:** The heating function is switched off and the frost protection function is active. The heating circuit pump is switched off.
  If a second heating circuit is connected, the heating circuit pump is switched off and the heating circuit mixer is closed. The outside temperature is monitored. When the outside temperature falls below 3 °C, the controller switches the heating pump on for 10 minutes after the end of the frost protection delay time. If a second heating circuit is connected, the heating circuit mixer remains closed. After the end of the time, the controller checks if the flow temperature is less than 13 °C. If the temperature is greater than 13 °C, the heating circuit pump is switched off.
  If a second heating circuit is connected, the temperature of the VF2 temperature sensor is evaluated and the heating circuit pump is switched off at a temperature greater than 13 °C. If the temperature is less than 13 °C, the controller switches the heating function on and activates the heating circuit pump. The controller sets the target room temperature to 5 °C and checks again if the outside temperature has reached 4 °C. If the outside temperature is greater than 4 °C, it switches the heating function and the heating circuit pump off.
- **ECO:** The heating function is switched off.
  If a second heating circuit is connected, the heating circuit pump is switched off and the heating circuit mixer is closed. The outside temperature is monitored. If the outside temperature falls below 3 °C, the controller switches the heating function on after the end of the frost protection delay time. The heating circuit pump is activated.
  If a second heating circuit is connected, the heating circuit pump and the heating circuit mixer are activated. The controller controls the target room temperature to the set "Night temperature". Despite the heating function being activated, the burner is only active on demand. The heating function remains active until the outside temperature rises above 4 °C, after which the controller switches the heating function off again, but the outside temperature monitoring remains active.
- **Night temperature:** The heating function is switched on and the target room temperature is set to the set "Night temperature" and adjusted to the "Night temperature".

## 8.5 System configuration: Domestic hot water

### 8.5.1 Setting the target temperature for domestic hot water (desired hot water temperature)

**Menu → Installer level → System configuration [Domestic hot water ----] → Cylinder temp. target**
This function allows you to define the target temperature for a connected domestic hot water cylinder ("desired hot water temperature").
To do this, the temperature for the domestic hot water cylinder must be set to the maximum value in the heat generator.
You must select the temperature in such a way that the heat requirement of the operator is just covered.

### 8.5.2 Reading the current temperature of the domestic hot water cylinder

**Menu → Installer level → System configuration [Domestic hot water ----] → Cyl. temp. current**
This function allows you to read the current measured value of the SP1 cylinder sensor.

### 8.5.3 Reading the status of the cylinder charge pump

**Menu → Installer level → System configuration [Domestic hot water ----] → Cylinder charge pump**
This function allows you to read the status of the cylinder charge pump (On, Off).

### 8.5.4 Reading the status of the circulation pump

**Menu → Installer level → System configuration [Domestic hot water ----] → Circulation pump**
This function allows you to read the status of the circulation pump (On, Off).

### 8.5.5 Defining the day for executing the anti-Legionella function

**Menu → Installer level → System configuration [Domestic hot water ----] → Anti-legionella day**
With this function, you can define a day or a block of days for execution of the anti-Legionella function.
When the anti-Legionella function is enabled, the respective cylinder and the corresponding hot water pipes are heated up to a temperature of over 60 °C on the set day or block of days. To this end the value of the target cylinder temperature is automatically raised to 70 °C (with 5 K hysteresis). The circulation pump is activated.
The function is terminated automatically when the cylinder sensor SP1 measures a temperature of > 60 °C for more than 60 minutes or after a period of 120 minutes has elapsed (to avoid getting "stuck" in this function if water is drawn simultaneously).
Factory setting = Off means no anti-Legionella function (due to risk of scalding)!

If "Days away from home" have been planned, the anti-Legionella function is not active during these days. It is activated directly on the first day after the "Days away from home" have elapsed and is executed on the defined weekday/block of days at the defined time **(→ Section 8.5.6)**.
Example:
The anti-Legionella function should be executed weekly on Tuesday at 08:00 a.m. The planned "Days away from home" end on Sunday at 24:00 hours. The anti-Legionella function is activated on Monday at 00:00 hours and executed on Tuesday at 08:00 hours.

### 8.5.6 Defining the time for executing the anti-Legionella function

**Menu → Installer level → System configuration [Domestic hot water ----] → Anti-legionella time**
With this function, you can define the time for executing the anti-Legionella function.
When the time is reached on the defined day or block of days, the function starts automatically if "Days away from home" (holidays) are not planned.

### 8.5.7 Defining the offset for charging the domestic hot water cylinder

**Menu → Installer level → System configuration [Domestic hot water ----] → Cylinder boost offset**
Only with a connected VR 61/2 or VR 68/2
With this function, you can define an offset value (K) for the desired hot water temperature. The domestic hot water cylinder is then charged with the temperature that results from the total of the desired hot water temperature and this offset value.

### 8.5.8 Defining the run-on time for the cylinder charge pump

**Menu → Installer level → System configuration [Domestic hot water ----] → Load pump**
With this function, you can define a run-on time for the cylinder charge pump. The high flow temperature required for cylinder charging continues to be delivered to the cylinder as far as possible by means of the load-pump overrun before the heating circuits, the generator circuit in particular, are enabled again.

When cylinder charging ends ("desired hot water temperature" reached), the controller switches the boiler off. The run-on time for the cylinder charge pump starts. The controller automatically deactivates the cylinder charge pump after the run-on time has elapsed.
If a VIH RL cylinder is connected and if the cylinder is connected directly to the boiler, the function has no effect.

#### 8.5.9 Activating parallel charging (domestic hot water cylinder and mixing circuit)

**Menu → Installer level → System configuration [Domestic hot water ----] → Paral. cyl. charge**
With this function, you can define, for the connected mixing circuit, that the mixing circuit should continue to be heated during charging of the domestic hot water cylinder.
When parallel charging is enabled, the mixing circuit continues to be supplied while the cylinder is being charged. Provided there is a demand for heat in the mixing circuit, the controller does not deactivate the heating circuit pump in the mixing circuit.
HEATING 1 is always deactivated during cylinder charging.

#### 8.5.10 Setting the relay output for cylinder charge pump and circulation pump

**Menu → Installer level → System configuration [Domestic hot water ----] → LP/ZP relay connection**
Only with a connected VR 61/2
With this function, you can use the controller to activate the desired actuation of a cylinder charge pump (LP) or circulation pump (ZP) for an implemented hydraulic scheme. The setting "Not connected" means that the output on the VR 61/2 is not used.

### 8.6 System configuration: Solar

#### 8.6.1 Reading the value of the cylinder sensor SP2

**Menu → Installer level → System configuration [Solar ----] → Sensor Cylinder 2**
Only with a connected VR 68/2
This function allows you to read the current measured value of the SP2 cylinder sensor.

#### 8.6.2 Reading the value of the solar gain sensor

**Menu → Installer level → System configuration [Solar ----] → Sensor solar gain**
Only with a connected VR 68/2
This function allows you to read the current measured value of the gain sensor.

#### 8.6.3 Reading the status of the solar pump

**Menu → Installer level → System configuration [Solar ----] → Status solar pump**
Only with a connected VR 68/2
This function allows you to read the current status of the solar pump (On, Off).

#### 8.6.4 Reading the value of the TD1 sensor

**Menu → Installer level → System configuration [Solar ----] → Sensor TD1**
Only with a connected VR 68/2
This function allows you to read the current measured value of the TD1 cylinder sensor.

#### 8.6.5 Reading the value of the TD2 sensor

**Menu → Installer level → System configuration [Solar ----] → Sensor TD2**
Only with a connected VR 68/2
This function allows you to read the current measured value of the TD2 cylinder sensor.

#### 8.6.6 Reading the status of the multi relay

**Menu → Installer level → System configuration [Solar ----] → Status multi relay**
Only with a connected VR 68/2
This function allows you to read the current status of the multi relay (On, Off).

### 8.6.7 Reading the runtime of the solar pump

**Menu → Installer level → System configuration [Solar ----] → Solar pump runtime**
Only with a connected VR 68/2
This function allows you to read the measured operating hours of the solar pump since start-up or since the last reset.

### 8.6.8 Resetting the runtime measurement of the solar pump

**Menu → Installer level → System configuration [Solar ----] → Reset solar runtime**
Only with a connected VR 68/2
This function allows you to set the totalled operating time in hours of the runtime measurement for the solar pump back to 0.

### 8.6.9 Activating the solar pump on temperature difference control

**Menu → Installer level → System configuration [Solar ----] → Pump control**
Only with a connected VR 68/2
This function allows you to keep the solar circuit at the activation value, and thus in operation, for as long as possible. For this purpose the pump is switched on and off in periodical bursts depending on the collector temperature and "lower cylinder temperature".
On reaching the on temperature difference, the function is started with an activation duration of 30 % - i.e. the pump is switched on for 18 s and then switched off for 42 s.
As the temperature difference increases, the activation duration is increased (e.g. 45 s on, 15 s off). As the temperature difference decreases, the activation duration is decreased (e.g. 20 s on, 40 s off). The period length is always a minute.

Does not apply in combination with a VMS solar station.

### 8.6.10 Defining the priority for charging the domestic hot water cylinder

**Menu → Installer level → System configuration [Solar ----] → Lead cylinder**
Only with a connected VR 68/2
In systems with more than one solar charged domestic hot water cylinder, the lead cylinder is charged as a priority. With this function you can define a lead cylinder.
1 = Cylinder 1 is the cylinder with cylinder sensor SP1
2 = Cylinder 2 is the cylinder with cylinder sensor TD1
This function is only effective if you set "Cylinder 2" for the multi relay when making the setting **(→ Section 8.6.12)**.

### 8.6.11 Setting the flow volume of the solar circuit

**Menu → Installer level → System configuration [Solar ----] → Solar flow volume**
Only with a connected VR 68/2
This function allows you to set the flow volume for the solar circuit. The correct setting of the flow volume is required so that the solar gain can be determined correctly.
The setting of the flow rate depends on the setting of the solar pump. An incorrect setting results in an inaccurate calculation of the solar gain.

### 8.6.12 Defining the setting for multi relay

**Menu → Installer level → System configuration [Solar ----] → Multi relay**
Only with a connected VR 68/2
This function allows you to define if, depending on the installed hydraulic scheme, a difference control should be performed or if the second cylinder should be charged.

### 8.6.13 Activating the solar pump kick

**Menu → Installer level → System configuration [Solar ----] → Solar pump kick**
Only with a connected VR 68/2
This function allows you to activate a pump kick for the solar pump, in order to speed up the temperature recording of the collector temperature.
Depending on the design, there is a time delay in some collectors during calculation of the measured value for temperature recording. With the solar pump kick function, you can reduce the time delay.
When the solar pump kick function is activated, the solar pump is switched on for 15 s (solar pump kick), when the temperature at the collector sensor has risen by 2 K/hour. This transports the heated solar fluid to the point of measurement more quickly.
If the temperature difference between the collector and the cylinder exceeds the preset switch-on difference, the solar pump runs for an appropriate length of time to heat up the cylinder (difference control).

### 8.6.14 Setting the solar circuit protection

**Menu → Installer level → System configuration [Solar ----] → Solar circuit prot.**
Only with a connected VR 68/2

With this function, you can define a temperature threshold for the calculated collector temperature in the solar circuit. If the available solar heat exceeds the current heat requirement (e.g. all cylinders fully charged), the temperature in the collector array may rise steeply.
If the protection temperature set at the collector sensor is exceeded, the solar pump is switched off to protect the solar circuit (pump, valves, etc.) against overheating. The solar pump is switched back on once the system has cooled down (30 K hysteresis).
In combination with a VMS solar station, the setting parameters are hidden. The solar station has its own protection function, which is always active.

### 8.6.15 Defining the maximum temperature for solar cylinder

**Menu → Installer level → System configuration [Solar ----] → Max. temperature**
Only with a connected VR 68/2
This function allows you to define a maximum value as a limit for the solar cylinder temperature, in order to guarantee the highest possible gain from the solar cylinder heating, but also to ensure protection against calcification.
The maximum of cylinder sensors SP1 and SP2 is used for the measurement.
For the second cylinder (swimming pool) cylinder sensor TD1 is used.
If the set maximum temperature is exceeded, the controller switches the solar pump off.
Solar charging is only enabled again once the temperature at the active sensor drops 1.5 K below the maximum temperature.
The maximum temperature can be set separately for each cylinder.
The programmed maximum temperature must not exceed the cylinder's maximum permissible water temperature!

### 8.6.16 Defining the on temperature difference value for solar charging

**Menu → Installer level → System configuration [Solar ----] [Solar cylinder1/2 ----] → On temp. diff.**
Only with a connected VR 68/2
This function allows you to define a difference value for starting solar charging. If the temperature difference between cylinder sensor SP2 and collector sensor KOL1 exceeds the set value, the controller switches the solar pump on and the solar cylinder is charged.
The difference value can be defined separately for two connected solar cylinders.

Does not apply in combination with a VMS solar station.

### 8.6.17 Defining the off temperature difference value for solar charging

**Menu → Installer level → System configuration [Solar ----] [Solar cylinder1/2 ----] → Off temp. diff.**
Only with a connected VR 68/2
This function allows you to define a difference value for stopping solar charging. If the temperature difference between cylinder sensor SP2 and collector sensor KOL1 falls below the set value, the controller switches the solar pump off and the solar cylinder is no longer charged.
The off temperature difference value must be at least 1 K less than the set on temperature difference value. Therefore the value for the setting difference is automatically adjusted when 1 K is exceeded.
You can define the difference value separately for two connected solar cylinders.

Does not apply in combination with a VMS solar station.

### 8.6.18 Defining the on temperature difference value for second difference control

**Menu → Installer level → System configuration [Solar ----] [2nd difference control ----] → On temp. diff.**
Only with a connected VR 68/2
This function allows you to define a difference value for starting solar support.
If the temperature difference between cylinder sensor TD1 and temperature sensor TD2 in the return of the solar circuit exceeds the set value, the controller activates output MA (Multi relay).
This function is only effective if "Diff.Reg." is selected when setting the multi relay **(→ Section 8.6.12)**.

### 8.6.19 Defining the off temperature difference value for second difference control

**Menu → Installer level → System configuration [Solar ----] [2nd difference control ----] → Off temp. diff.**
Only with a connected VR 68/2
This function allows you to define a difference value for stopping solar support.
If the temperature difference between cylinder sensor TD1 and temperature sensor TD2 in the return of the solar circuit falls below the set value, the controller deactivates the output MA (Multi relay).
This function is only effective if "Diff.Reg." is selected when setting the multi relay **(→ Section 8.6.12)**.

## 8.7 Selecting the expansion module for sensor/ actuator test

**Menu → Installer level → Sensor/ actuator test → [Select module]**
This function allows you to select a connected expansion module for the sensor and actuator test.
The controller lists the actuators and sensors of the selected expansion module.
If you confirm the selection of an actuator with "Ok", the controller activates the relay. The actuator's function can now be checked. Only the activated actuator is active, all other actuators are "deactivated" at this time. For example, you can drive a mixer in the "OPEN" direction and check that it is connected the right way round or activate a pump and check that it starts up.
If you select a sensor, the controller shows the measured value of the selected sensor. For the selected component, read the measured values from the sensors and check whether the individual sensors are providing the expected values (temperature, pressure, flow volume ...).

## 8.8 Activating the screed drying function

**Menu → Installer level → Screed drying function → HEATING 1/2**
With this function, you can "dry heat" freshly laid screed in accordance with the construction regulations, according to a defined time and temperature plan.
When floor drying is activated, all the selected operating modes are interrupted.
The controller controls the flow temperature of the controlled heating circuit according to a pre-set program regardless of the outside temperature.
The function is available for HEATING 1 and HEATING 2, but not for both heating circuits at the same time. If mixing module VR 61 is connected, the function is only available for HEATING 2. The controller operates HEATING 1 in the set mode.
Target flow temperature on starting day 1: 25 °C.

| Days after starting the function | Target flow temperature for this day [°C] |
|---|---|
| 1 | 25 |
| 2 | 30 |
| 3 | 35 |
| 4 | 40 |
| 5 | 45 |
| 6 - 12 | 45 |
| 13 | 40 |
| 14 | 35 |
| 15 | 30 |
| 16 | 25 |
| 17 - 23 | 10 (frost protection function, pump in operation) |
| 24 | 30 |
| 25 | 35 |
| 26 | 40 |
| 27 | 45 |
| 28 | 35 |
| 29 | 25 |

**Tab. 8.1 Screed drying time and temperature profile**

In the display, the mode is displayed with the current day and the target flow temperature. You can set the current day manually.
When the function is started, the current time of the start is saved. The day is changed exactly at this time.
After a mains Off/On, floor drying starts with the last active day.
The function ends automatically when the last day of the temperature profile has elapsed (day = 29)
or
if you set the start day to 0 (day = 0).

## 8.9 Changing the code for Installer level

**Menu → Installer level → Change code**
This function allows you to change the access code for "Installer level" operating level.
If the code is no longer available, you must reset the controller to the factory setting in order to obtain access to Installer level again.

### 8.10 Operator level functions

- Select language
- Set date, time
- Switch to summer time
- Set display contrast
- Set offset room temperature
- Set offset outside temperature
- Set modes for heating, hot water production and the circulation pump
- Change heating circuit names
- Restore factory settings
- Activate advanced functions
- Set desired temperature for HEATING 1/HEATING 2
- Set desired temperatures for hot water production
- Set up time programmes for HEATING 1/HEATING 2, hot water production and the circulation pump
- Plan days away from home (holiday function)
- Plan days at home (bank holiday function)
- Reset the solar gain

# 9 Handing over the unit to the owner

You must inform the operator of the controller about the handling and function of the controller.

- ➤ Pass on the instructions and documents for the unit to the operator for safe keeping.
- ➤ Tell the operator the article number of the controller.
- ➤ Tell the operator to keep the instructions close to the controller.
- ➤ Go through the operating instructions with the operator and answer any questions.
- ➤ To protect persons against scalding, inform the operator about
  - whether the anti-Legionella function is activated,
  - when the anti-Legionella function starts,
  - if a cold water mixing valve is integrated as protection against scalding.
- ➤ To avoid malfunctions, provide information on which rules the operator must observe:
  - Only operate the heating system if it is in perfect technical condition,
  - Do not remove, bridge or disable any safety or monitoring devices.
  - Immediately rectify any faults and damage that may negatively affect safety,
  - If the controller is installed in the living room, ensure that the controller is not covered by furniture, curtains or other objects and that all radiator valves in the room in which the controller is mounted, are fully open.
- ➤ To avoid damage from frost, inform the operator at the time of handover that
  - the operator must ensure that the heating system remains in operation and rooms are heated adequately during periods of absence during frost,
  - the operator must observe the frost protection instructions.

# 10 Fault recognition and clearance

## 10.1 Error messages

If a fault occurs in your heating system, an error message will appear in the controller display instead of the basic display. You can access the basic display again by pressing function key "Back".
If the display remains dark or you cannot make any change to the display by pressing the function keys or control knob, there is a system error.

You can also read all current error messages under menu option "Information/System status" **(→ 10.2)**.

| Display | Meaning | Connected units | Cause |
|---|---|---|---|
| Heat generator fault | Fault in boiler | Boiler | See boiler instructions |
| Heat generator communication fault | Boiler connection fault | Boiler | Cable defective, plug connection not correct |
| VIH RL communication fault | Cylinder connection fault | Cylinder actoSTOR VIH RL | Cable defective, plug connection not correct |
| External current anode fault | External current anode fault Cylinder | Cylinder actoSTOR VIH RL | Cable defective, plug connection not correct, external current anode defective |
| Sensor T1 fault | Fault in temperature sensor 1 | Temperature sensor 1 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T2 fault | Fault in temperature sensor 2 | Temperature sensor 2 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T3 fault | Fault in temperature sensor 3 | Temperature sensor 3 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T4 fault | Fault in temperature sensor 4 | Temperature sensor 4 | Cable defective, plug connection not correct, temperature sensor defective |
| VR 68/2 communication fault | Solar module VR 68/2 connection fault | Solar module VR 68/2 | Cable defective, plug connection not correct |
| Sensor KOL fault | Collector sensor fault | Solar module VR 68/2 | Collector sensor defective |
| Sensor SP1 fault | Fault in cylinder sensor 1, first cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor SP2 fault | Fault in cylinder sensor 2, first cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor TD1 fault | Fault in cylinder sensor 1, second cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor TD2 fault | Fault in cylinder sensor 2, second cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Solar gain sensor fault | Solar gain sensor fault | Solar gain sensor | Cable defective, plug connection not correct, solar gain sensor defective |
| VR 61/2 communication fault | Mixer module VR 61/2 connection fault | Mixer module VR 61/2 | Cable defective, plug connection not correct |
| Sensor VF2 fault | Fault in flow sensor VF2 | Mixer module VR 61/2 | Cable defective, plug connection not correct, flow sensor defective |

**Tab. 10.1 Error messages**

## 10.2 List of errors

**Menu → Information → System status → Status [Fault]**
If there is a fault, the status "Fault" is displayed. In this case, the right function key has the function "Display". Press the right function key to view the list of error messages.

Not all error messages in the list appear automatically on the display.

| Display | Meaning | Connected units | Cause |
|---|---|---|---|
| Heat generator fault | Fault in boiler | Boiler | See boiler instructions |
| Heat generator communication fault | Boiler connection fault | Boiler | Cable defective, plug connection not correct |
| Clean outside sensor | | External sensor | External sensor dirty |
| Communication fault actoSTOR | Cylinder connection fault | Cylinder actoSTOR VIH RL | Cable defective, plug connection not correct |
| External current anode fault | External current anode fault Cylinder | Cylinder actoSTOR VIH RL | Cable defective, plug connection not correct, external current anode defective |
| Sensor T1 fault | Fault in temperature sensor 1 | Temperature sensor 1 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T2 fault | Fault in temperature sensor 2 | Temperature sensor 2 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T3 fault | Fault in temperature sensor 3 | Temperature sensor 3 | Cable defective, plug connection not correct, temperature sensor defective |
| Sensor T4 fault | Fault in temperature sensor 4 | Temperature sensor 4 | Cable defective, plug connection not correct, temperature sensor defective |
| Heat exchanger calcified | Heat exchanger of the boiler is calcified | Boiler | See boiler instructions |
| VR 68/2 communication fault | Solar module VR 68/2 connection fault | Solar module VR 68/2 | Cable defective, plug connection not correct |
| Sensor KOL fault | Collector sensor | Solar module VR 68/2 | Collector sensor defective |
| Sensor SP1 fault | Fault in cylinder sensor 1, first cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor SP2 fault | Fault in cylinder sensor 2, first cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor TD1 fault | Fault in cylinder sensor 1, second cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Sensor TD2 fault | Fault in cylinder sensor 2, second cylinder | Solar module VR 68/2 | Cable defective, plug connection not correct, cylinder sensor defective |
| Solar gain sensor | Solar gain sensor fault | Solar gain sensor | Cable defective, plug connection not correct, solar gain sensor defective |
| VR 61/2 communication fault | Mixer module VR 61/2 connection fault | Mixer module VR 61/2 | Cable defective, plug connection not correct |
| Sensor VF2 fault | Fault in flow sensor VF2 | Mixer module VR 61/2 | Cable defective, plug connection not correct, flow sensor defective |

**Tab. 10.2 List of error messages**

## 10.3 Restore factory settings

You can reset the settings to the factory settings (**→ operating instructions**).

# 11 Warranty and customer service

**Vaillant warranty**
We only grant a Vaillant manufacturers warranty if a suitably qualified engineer has installed the system in accordance with Vaillant instructions. The system owner will be granted a warranty in accordance with the Vaillant terms and conditions. All requests for work during the guarantee period must be made to Vaillant Service Solutions (0870 6060 777).

**Vaillant Service**
To ensure regular servicing, it is strongly recommended that arrangements are made for a Maintenance Agreement. Please contact Vaillant Service Solutions (0870 6060 777) for further details.

# 12 Taking out of service

**Danger!**
**Risk of death from live connections!**
When working in the control cabinet of the boiler there is a risk of death from electric shock. Continuous voltage is present on the mains connection terminals, even if the main switch is turned off!

- ➤ Switch the main switch off before working on the control cabinet of the boiler.
- ➤ Disconnect the boiler from the power mains by disconnecting the mains plug or by de-energising the boiler via an isolating device with a contact opening of at least 3 mm (e. g. fuses or power switches).
- ➤ Secure the power supply against being switched on again.
- ➤ Open the control cabinet only when the appliance is disconnected from the power source.

## 12.1 Taking the controller out of service

If you want to replace or remove the heating system controller, you must first take the boiler out of service.

- ➤ To do this, follow the instructions in the boiler instructions.
- ➤ Ensure that the boiler is disconnected from the power source.

The rest of the procedure depends on where the controller is installed.

**For wall-mounting:**

- ➤ Insert a screwdriver into the slot (**7**) on the wall mounting base (**2**) **(→ Section 4.4.1)**.
- ➤ Carefully lever the controller (**1**) out of the wall mounting base (**2**).
- ➤ Unfasten the eBUS cable from the terminal strip on the controller.
- ➤ Unfasten the eBUS cable from the terminal strip on the boiler.
- ➤ Unscrew the wall mounting base from the wall.
- ➤ Plug the holes in the wall if necessary.

**For installation in the boiler:**

- ➤ If necessary, open the front cover on the boiler.
- ➤ Carefully remove the controller from the control cabinet of the boiler.
- ➤ Undo the 6-way edge connector at plug location X41 on the boiler.
- ➤ If necessary, close the front cover on the boiler.

## 12.2 Recycling and disposing of the controller

Both the controller and the associated transport packaging are made primarily of recyclable raw materials.

### 12.2.1 Unit

Neither the controller or any of its accessories belong in the household waste.

- ➤ Make sure the old unit and any accessories are disposed of properly.

### 12.2.2 Packaging

- ➤ The recognised specialist company that installed the unit is responsible for disposing of the transport packaging.

# 13 Technical data

## 13.1 Controller VRC 470

| Designation | Unit | VRC 470 |
|---|---|---|
| Operating voltage $U_{max}$ | V | 24 |
| Current consumption | mA | < 50 |
| Supply cable cross-section | $mm^2$ | 0.75...1.5 |
| Protection type | - | IP 20 |
| Protection class | - | III |
| Max. permitted ambient temperature | °C | 50 |
| Height | mm | 115 |
| Width | mm | 147 |
| Depth | mm | 50 |

**Tab. 13.1 Technical specifications VRC 470**

## 13.2 Sensor resistances

| Temperature (°C) | Resistance (ohms) |
|---|---|
| -25 | 2167 |
| -20 | 2067 |
| -15 | 1976 |
| -10 | 1862 |
| -5 | 1745 |
| 0 | 1619 |
| 5 | 1494 |
| 10 | 1387 |
| 15 | 1246 |
| 20 | 1128 |
| 25 | 1020 |
| 30 | 920 |
| 35 | 831 |
| 40 | 740 |

**Tab. 13.2 Outside temperature sensor key data**

# 14 Glossary

**Auto_Off**
In the "Auto_Off mode" (Installer level), in Automatic mode the control functions outside active time periods can be specified separately for each heating circuit. There are three control modes (frost protection, ECO, set-back temp.) available for selection, which can be further adapted through the use of the room temperature control.

**Circulation pump**
When you turn on the hot water tap it can take a few moments - depending upon the length of the pipe - before hot water comes out. A circulation pump pumps hot water through the hot water pipe. This ensures that hot water is immediately available when you turn on the tap. Periods can be set for the circulation pump.

**DCF77 receiver**
A DCF77 receiver receives a remote time signal from sender DCF77 (D-Germany C-Long-wave transmitter F-Frankfurt 77). The time signal sets the time on the controller automatically and provides automatic switching between summer time and winter time. The DCF77 time signal is not available in all countries.

**Flow temperature**
See Heating flow temperature.

**Frost protection delay time**
By setting a frost protection delay time (Installer level) the activation of the frost protection function (outside temperature < 3 °C) can be delayed by a certain period of time (1 - 12 hours).
The frost protection delay setting also works in the "ECO" function in the "Auto_Off" mode (see location). The frost-protection delay time starts when the outside temperature drops below 3 °C.

**Frost protection function**
The frost protection function protects the heating system and dwelling against frost damage. It remains active in the operating mode "OFF".
The frost protection function monitors the outside temperature. When the outside temperature drops below 3 °C, the heating pump is switched on for approx. 10 min. and then off for 10 to 60 min. (depending on the outside temperature). If the heating flow temperature is lower than 13 °C, the boiler is switched on. The target room temperature is regulated at 5 °C. If the outside temperature rises above 4 °C, the outside temperature monitoring remains active while the heating pump and boiler are switched off.
When the outside temperature drops below -20 °C, the boiler is switched on. The target room temperature is regulated at 5 °C.

**Heating circuit**
A heating circuit is a closed circulation system of pipes and heat consumers (e. g. radiators). The heated water from the boiler flows into the heating circuit and returns to the boiler as cooled water.
A heating installation usually has at least one heating circuit. However additional heating circuits can be connected, e.g. to supply several dwellings or additional underfloor heating.

**Heating curve**
The heating curve represents the relationship between external temperature and the flow temperature. The selection of a heating curve allows you to influence the flow temperature of the heating system and therefore also the room temperature.
Fig. 14.1 shows the possible heating curves for a target room temperature of 20 °C.
If, for example, heating curve 0.4 is selected, a flow temperature of 40 °C is maintained at an outside temperature of -15 °C.

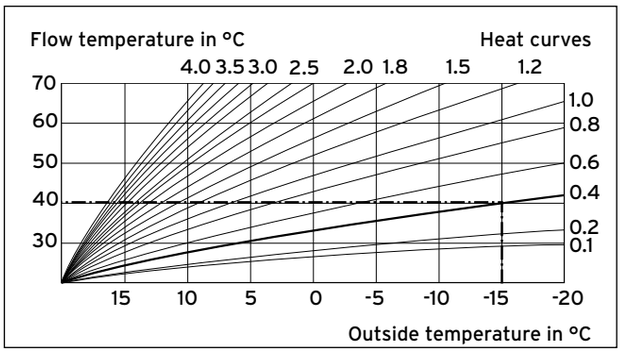


**Fig. 14.1 Heating curve diagram**

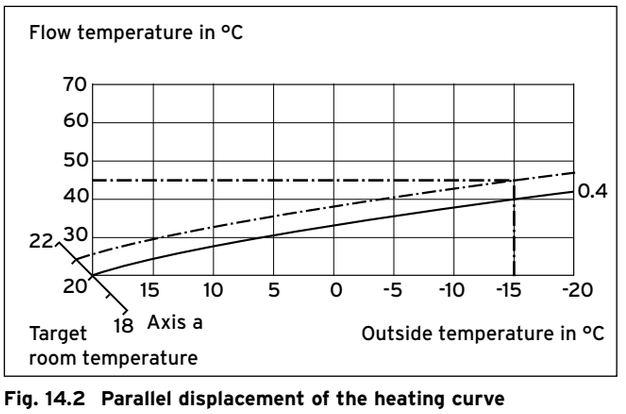


**Fig. 14.2 Parallel displacement of the heating curve**

If heating curve 0.4 is selected and 21 °C rather than 20 °C is specified as the target room temperature, the heating curve is displaced as shown in Fig. 14.2. The heating curve is displaced according to the value of the room target temperature along axis a which is angled at 45°, This means that when the outside temperature is -15 °C, the control provides a flow temperature of 45 °C.

**Heating flow temperature**
The boiler heats water which is then pumped through the heating installation. The temperature of this hot water as it leaves the boiler is referred to as the flow temperature.

**HK2**
HK2 refers to heating circuit 2 in addition to the unit-internal heating circuit 1. It therefore refers to the first heating circuit in the heating installation.

**Hot water production**
The boiler heats the water in the domestic hot water cylinder to the selected target temperature. If the temperature in the domestic hot water cylinder falls by specific amount, the water is heated up again to the target temperature. You can set time periods for heating up the contents of the cylinder.

**Legionella**
Legionella are water-borne bacteria which can quickly propagate and cause serious lung diseases. They occur wherever heated water provides the optimum conditions for multiplication. Temporarily heating the water to above 60 °C kills off the legionella.

**Mode**
With the modes, you determine how the heating system or hot water production is controlled, e.g. in automatic mode or manually.

**Periods**
Three time periods per day can be set for the heating, hot water production and circulation pump.

**Example:**
Period 1: Mon 09.00 - 12.00 hrs.
Period 2: Mon 15.00 - 18.30 hrs.
In the heating, each period is allocated a target value, which the heating system maintains during this time.
For hot water generation, the target hot water temperature prevails for all time periods.
In the case of the circulation pump the time periods determine the operating times.
In automatic mode the system is controlled as per the specified values in the time periods.

**Room temperature**
The room temperature is the temperature actually measured in the dwelling.

**Room temperature control**
In menu page C8 "HK1 Parameter" you define under option "Room temp control" if you are going to use the integrated temperature sensor in the controller or in the remote control unit. A prerequisite is that the controller is wall-mounted or the VR 81/2 remote control unit is connected.

**Set-back temperature**
The set-back temperature is the temperature to which your heating system reduces the room temperature outside set set period.

**Soft key function**
The function of the function keys switches depending on the menu you are currently in.
The current functions of the function keys are displayed in the bottom display lines.

**Target room temperature (Desired temperature)**
The target room temperature is the temperature that you would like in the dwelling and which is specified to the controller. The boiler continues to provide heat until the room temperature is equal to the target room temperature. The target room temperature serves as a guideline for regulating the flow temperature according to the heating curve.

**Target values**
Target values are desired values that you specify in the controller, e.g. the target room temperature or target temperature for hot water production.

**Weather-compensated**
The outside temperature is measured by a separate sensor which is mounted in the open air, and the results are transmitted to the controller. At low outside temperatures the controller provides increased heating output; at higher outside temperatures the heating output is reduced.

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